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Environmental Stewardship— Environmental Characterization and Remediation

Quality Procedure

for **Design Basis**

☒ **NES Approved**

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Design Basis

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List of Acronyms and Abbreviations

DOE-LASO	U.S. Department of Energy-Los Alamos Site Office
ECR	Environmental Characterization and Remediation
EDS	employee development system
ENV	Environmental Stewardship Division
ER	Environmental Remediation
LANL	Los Alamos National Laboratory
LIR	Laboratory Implementation Requirement
ML	management level
NES	nuclear environmental site
PL	project leader
QP	quality procedure
RDL	responsible division leader
RLM	responsible line manager
RPF	Records Processing Facility
SME	subject matter expert

Design Basis

1.0 PURPOSE

This quality procedure (QP) states the responsibilities and describes the process for developing a design basis for projects resulting in real property improvements within the Los Alamos National Laboratory (LANL or the Laboratory) Environmental Stewardship (ENV) Division - Environmental Characterization and Remediation (ECR) Group and/or surveillance and maintenance projects for existing Nuclear Environmental Sites (NES). This procedure does not apply to pre-design activities.

2.0 SCOPE

All **participants** shall implement this mandatory QP when developing or modifying design basis documents for the ENV-ECR group.

3.0 TRAINING

- 3.1 **Participants** shall train to (e.g., read and/or complete on-the-job or classroom training) and use the current version of this procedure; contact the author of this QP if the text is unclear.
- 3.2 **Participants** shall document training to this procedure in accordance with QP-2.2, "Personnel Training Management" using the training documentation link at the end of this procedure, if they possess a CRYPTOCARD, have administrative authority to the Laboratory, and are listed in the employee development system (EDS), or by using hardcopy forms located at <http://erinternal.lanl.gov/Quality/user/forms.asp>.
- 3.3 The responsible **project leader** shall monitor the proper implementation of this procedure.
- 3.4 The responsible **team leader** shall ensure that the appropriate personnel complete all applicable training assignments.
- 3.5 **Participants** may request any needed assistance with implementation of this procedure from ECR Quality Integration and Improvement (QII.)
- 3.6 The **ENV-ECR safety basis expert** shall be responsible for ensuring the proper training of project leaders managing work at NESs.

4.0 DEFINITIONS

- 4.1 *CRYPTOCARD*—A credit-card-sized computer that generates "one-time" passwords or "passcodes." Like a desktop computer, The CRYPTOCARD

has a keypad for input, a display window for output, memory, and a microprocessor.

- 4.2 *Design*—Approved implementing plans, drawings, criteria, procedures, specifications, and drawings governing all work on a project. This includes construction contracts, contractor purchase orders, and industry codes and standards invoked by the design. A design is necessary for any capital improvement project exceeding \$100,000 (see LANL engineering standards section Z10).
- 4.3 *Design basis*—The information which identifies the specific functions to be performed by a design feature and the specific values or ranges of values chosen for controlling parameters as reference bounds for design. These values may form
- restraints derived from generally accepted “state-of-the-art” practices for achieving functional goals; or
 - requirements derived from analysis (based on calculations and/or experiments) of the effects of a postulated accident for which a structure, system, or component must meet its functional goals.
- 4.4 *Design documents*—Technical documents, including technical design reports or memoranda, design drawings, specifications, and calculations documents that represent the design and govern the performance of construction activities. The design basis document is considered a fundamental design document.
- 4.5 *Design process*—The process of performing a design.
- 4.6 *DOE-LASO representative*—The site U.S. Department of Energy (DOE) representative responsible for approving environmental designs that are performed by the ENV-ECR Group.
- 4.7 *Employee development system (EDS)*—The Laboratory’s official training records database that maintains and archives vital training records. EDS attributes include, but are not limited to, a training program catalog, registration, and enrollment functions; class lists; course cost information; historical information of LANL worker training records; transcripts of completed training for LANL workers; individual training plans; and training reports.
- 4.8 *Graded approach*—The depth of detail required, and the magnitude of resources expended, so that a particular management element is tailored to be commensurate with the relative importance of the facility work and with safety, health, and environmental compliance requirements, with safeguards and security considerations, programmatic importance, and with the magnitude of the hazard and financial impact. Refer to Laboratory

implementation requirement (LIR) 230-01-02, “Graded Approach for Facility Work,” located at <http://labreg.lanl.gov> and QP-3.7, “Graded Approach.”

Note: Facility may be defined as a tank, building, waste site, monitoring well, or a laboratory.

- 4.9 *Grading*—The facility classification of management level (ML1–ML4) resulting from the application of the graded approach.
- 4.10 *Participant*—An inclusive term for any LANL/staff augmentation employee, deployed worker, or subcontractor, inclusive of project leaders, team leaders, and project personnel, who participates in activities conducted by, or on behalf of, the ECR Group.
- 4.11 *Pre-design activity*—An activity, such as planning, drilling, investigations, and data collection, needed to determine the practicality and/or feasibility of performing designs, or for gathering data and information needed to define design requirements (except for NES sites where a facility is present).
- 4.12 *Project leader*—A LANL employee or deployed worker directly responsible for the management of one or more projects.
- 4.13 *Quality procedure*—A document that describes the process for performing an activity governed by the “Quality Management Plan.”
- 4.14 *Quality specialist*—An ENV-ECR individual designated by the Quality Program project leader to participate as a member of the Design Review Team.
- 4.15 *Responsible division leader (RDL)*—The division leader responsible for the facility where ENV-ECR work will be carried out.
- 4.16 *Responsible line manager (RLM)*—The ENV-ECR group leader responsible for approving and performing work associated with the subject project.
- 4.17 *Team leader*—The individual in direct line of authority for the project leader.
- 4.18 *Technical expert*—An individual qualified to perform evaluations as the result of relevant background, education, and/or experience.

5.0 RESPONSIBLE PERSONNEL

The following personnel are responsible for activities identified in this procedure:

- DOE-LASO representative
- Participant

- Project leader
- Quality specialist
- Responsible division leader
- Responsible line manager
- Subject matter expert
- Team leader

6.0 PROCEDURE

6.1 Design Participants

- 6.1.1 The **project leader** shall identify appropriate design participants as subject matter experts (SMEs).
- 6.1.2 The **project leader** shall document qualified technical experts to aid in developing/modifying the design basis documentation (Attachment A).
- 6.1.3 If personnel other than ENV-ER/ECR participants are qualified technical experts, the **project leader** shall document their qualifications in the Records Processing Facility (RPF) database (Attachment A).

6.2 Developing a Design Basis Document

- 6.2.1 The **project leader** and the project **SMEs** responsible for work related to a design shall collect and review all documents for relevance and validity in establishing or revising a design basis. Relevant information is any source of data or documentation validating existing site conditions and may include the following items:
 - Budgetary and scheduling information
 - Calculations
 - Design and as-built drawings
 - Field notes
 - Reports and planning documents
 - Site conditions
 - Specifications
 - Statements of Work

- Other historic written records
- 6.2.2 In the case of subcontracted design work, the design basis document may be developed as part of design preparation in accordance with QP-6.2, “Design Preparation.” In such cases, the subcontractor’s procedures for developing the design basis shall be used as long as the intent of this procedure (QP-6.1) is met.
- 6.2.3 The **project leader** and **SMEs** shall develop a list from all possible documents related to a site, of those relevant to forming a design basis. If an existing design basis document is available, it forms the basis for new and supplemental work, along with criteria for the proposed design.
- 6.2.4 The **project leader** and **SMEs** shall define and justify the “graded approach” for the work covered under the design basis. The “graded approach” shall be used for the selection of controls and verifications applied to various items and activities that are consistent with the
- importance to quality, safety, cost, schedule, and success of the activity;
 - magnitude of any hazard or risk involved;
 - life-cycle of a facility;
 - impact/consequences on the programmatic mission of a facility;
 - particular characteristics of a facility or activity;
 - nuclear safety classification or hazard category of the item or activity;
 - adequacy of existing safety documentation;
 - complexity of products or services involved; and
 - history of problems at a site or facility.
- 6.2.5 ML-4 work does not require a design basis.
- 6.2.6 Using information gleaned from relevant documents, the **project leader** and **SMEs** shall identify historic codes and standards used to develop the existing site improvements (if any).

Note: An existing design basis document may suffice for historic documentation.

6.2.7 **SMEs** shall develop lists of relevant codes, standards, practices, procedures, etc. to define the requirements that assure quality and performance of the product(s) and methods used in the design process. For example, a life safety code applies to structures, systems, or components where human activities occur.

6.2.8 The **project leader**, with the aid of SMEs, shall develop or modify the design basis project requirements, performance requirements, evaluation considerations, and design requirements to:

- identify the specific federal, state, and local regulations governing the design;
- define the functional requirements, including grading of the project and the identification of critical facilities, equipment, and systems;
- identify the performance requirements based on the functional requirements;
- perform evaluations, including calculations, reports, or other documentation justifying the selection of facility grading and design requirements; and
- include a reference list of drawings, specifications, calculations, and reports.

6.2.9 The **project leader** and **SMEs** shall develop a design basis document (such as a design basis memorandum) that documents the design basis. Documentation shall consist of the items listed in section 6.2.8 at a minimum.

6.3 Document Control for Design Documents

Note: Design documents are considered controlled documents and are subject to the process defined in QP-4.5, "Document Control."

6.3.1 The initial approved design basis document shall be Revision 0. Modifications to an existing Revision 0 design basis document shall bear a sequentially increasing revision number. Changes to the Revision 0 (or greater) document are initiated based on design process controlled changes, or by QP-6.8, "Design Field Change Process," for projects having "Issue for Construction" documents.

6.4 Review and Approval

- 6.4.1 The **project leader** is responsible for assuring formal review and approval of a design basis document in accordance with QP-4.9, "Document Development and Approval Process."
- 6.4.2 The review and approval of design basis documents prepared according to QP-6.2, "Design Preparation," shall conform to review-and-approval processes described in QP-6.2.
- 6.4.3 The design basis document containing only ML2–3 items (see graded approach) shall form a portion of the ENV-ECR record. Approvals include the project leader, individuals having technical input into the document, quality specialist, team leader, authorized derivative classifier (ADC), DOE-LASO representative, facility RDL, and the RLM.

7.0 LESSONS LEARNED

- 7.1 Before performing work described in this QP, **participants** should go to the Department of Energy Lessons Learned Information Services home page, located at <http://www.tis.eh.doe.gov/ll/ll.html>, and/or to the LANL Lessons Learned Resources web page, located at http://www.lanl.gov/projects/lessons_learned/, and search for applicable lessons.
- 7.2 During work performance, and/or after the completion of work activities, **participants**, as appropriate, shall identify, document, and submit lessons learned in accordance with the LANL Lessons Learned System located at http://www.lanl.gov/projects/lessons_learned/.

8.0 RECORDS

The **project leader** shall submit the following records to the Records Processing Facility, in accordance with QP-4.4, "Record Transmittal to the Records Processing Facility":

- Completed Technical Qualifications form
- Approved Design Basis document
- Completed Document Signature Form

9.0 REFERENCES

To implement this QP properly, **participants** should become familiar with the contents of the following documents, located at <http://erinternal.lanl.gov/Quality/user/qps.asp>:

- “Quality Management Plan”
- QP-2.2, “Personnel Training Management”
- QP-3.7, “Graded Approach”
- QP-4.4, “Record Transmittal to the Records Processing Facility”
- QP-4.5, “Document Control”
- QP-4.9, “Document Development and Approval Process”
- QP-6.2, “Design Preparation”
- QP-6.8, “Design Field Change”

Other related references:

- LIR 230-01-02, “Graded Approach for Facility Work,” located at <http://labreq.lanl.gov>

10.0 ATTACHMENTS

The **participant** using this QP may locate all forms associated with this procedure at <http://erinternal.lanl.gov/Quality/user/forms.asp>.

Attachment A: Design Basis Subject Matter Expert Technical Qualifications Form
(1 page)

[Using a CRYPTOCARD, click here to record "self-study" training to this procedure.](#)

If you do not possess a CRYPTOCARD or encounter problems, contact the RRES-ECR training specialist.

Attachment A:
Design Basis Subject Matter Expert Technical Qualifications Form

Technical Qualifications		
Member's Name:	Title and Group:	Qualification (see Note):
<p>Note: State that the individual's qualifications are described as an ENV-ECR position description or indicate that a resume of qualifications is attached.</p>		
QP-6.1, R0		Los Alamos National Laboratory ENV-ECR